

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

Technology Transitions Policy Task Force Seeks)
Comment on Potential Trials) GN Docket No. 13-5

COMMENTS OF CENTURYLINK

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July 8, 2013

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I. INTRODUCTION AND SUMMARY

CenturyLink submits these comments in response to the Commission's May 10, 2013 Public Notice seeking comment on various types of technical trials.¹ CenturyLink's comments focus on the Task Force's proposal for trials related to the ongoing transition from time-division multiplexing (TDM) to Internet Protocol (IP) format.

CenturyLink supports the concept of conducting trials to facilitate this important ongoing transition. IP-based voice services are steadily replacing the "plain old telephone services" that have largely defined telecommunications for more than a century. As ILECs and other voice providers transition their local voice networks to IP, they will increasingly exchange voice traffic in IP format. Indeed, CenturyLink is already doing that for some toll traffic.² Nevertheless, an "all-IP world" is still a long way off. Wireline and wireless networks are still generally designed in accordance with the ILECs' traditional hub-and-spoke TDM network.

¹ Technology Transitions Policy Task Force Seeks Comment on Potential Trials, GN Docket No. 13-5, DA 13-1016 (rel. May 10, 2013) (Public Notice); 78 Fed. Reg. 31542 (May 24, 2013); Public Notice, DA 13-1216 (rel. May 24, 2013).

² Such arrangements utilize the national network of CenturyLink's IXC affiliate, which has the necessary hardware and security systems to accept voice traffic in IP format and convert that traffic to TDM format for termination to the PSTN. CenturyLink's ILEC companies have not yet deployed the infrastructure necessary to perform these functions.

As they have with past technology transitions, well-designed trials can help facilitate this inevitable transition, by establishing a forum to work through technical and logistical issues associated with the transition, with minimal disruption to consumers; highlighting issues that require work from standard-setting organizations; and beginning to identify the appropriate regulatory framework for a post-TDM environment. On the other hand, poorly-designed trials could delay the IP migration by spawning resource-draining disputes over the applicability of legacy regulations and practices, rather than focusing on developing network configurations and practices that are tailored to the inherent capabilities and efficiencies of next-generation IP networks.

It would be a costly mistake to apply the existing regulatory-based TDM interconnection model to IP-to-IP interconnection for voice services for at least two reasons. *First*, such invasive, top-down regulation is unnecessary. The telecommunications industry of 17 years ago--when Congress enacted section 251's monopoly-minded, TDM-based interconnection mandates--is barely recognizable today. Providers of all stripes have invested billions of dollars in the next-generation networks that carry interconnected VoIP and other IP-based services. At the same time, widespread intermodal competition and technological substitution have caused ILECs to lose half their access lines, with wireless connections now outnumbering end-user switched access lines by nearly three-to-one and interconnected VoIP connections now accounting for 40% of residential wireline telephone connections (with a compound annual growth rate of 18%).³ Thus ILECs are, in fact, no longer "dominant" providers of legacy

³ See *Local Telephone Competition: Status as of June 30, 2012*, Industry Analysis and Technology Division, Wireline Competition Bureau, FCC, at 1, 2, 14 (Table 3) (June 2013), available at http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db0621/DOC-321568A1.pdf (*Local Telephone Competition Status Report*). Skype's highly-popular VoIP

services,⁴ much less the interconnected VoIP services that are the focus of the proposed trials. Indeed, non-ILECs provide more than 80% of interconnected VoIP services.⁵ Moreover, VoIP is simply a voice application carried on IP networks, suggesting that IP voice and data networks may well converge over time, further distancing IP voice services from their TDM-based forbears.⁶

Second, attempting to force-fit IP interconnection into the legacy interconnection framework would result in delay, uncertainty, and endless disputes, while derailing the negotiation of efficient commercial arrangements for the exchange of IP-based voice traffic. Such an outcome would mirror the tortured history of regulatory-driven TDM interconnection, in which the 1996 Act's interconnection and unbundling mandates resulted in years of uncertainty, as issues large and small were litigated (and often re-litigated) before state and federal regulators, district and appellate courts and even the U.S. Supreme Court.

IP peering and IP voice traffic exchange agreements have taken a different course. IP data providers have devoted their energies to developing innovative Internet services (rather than hearing room arguments), and, without a regulatory backdrop, have been able to negotiate flexible, evolving peering arrangements without resort to litigation. And, CenturyLink's voluntary participation (and the participation of other providers) in IP voice traffic exchange agreements is further evidence that the market can work. CLEC attempts to import legacy

service is excluded from these figures, because it does not meet the Commission's definition of "interconnected" VoIP service. *Id.* at 1 n.2.

⁴ That ILECs are still regulated as dominant for many services simply illustrates the degree to which the Commission's dominant/nondominant classification rules are out of touch with reality.

⁵ *Local Telephone Competition Status Report* at 7 (Figure 5).

⁶ Of course, this assumes that the Commission does not adopt premature rules for IP-to-IP voice interconnection -- through trials or otherwise -- and allows providers to negotiate interconnection arrangements based on efficiency and sound engineering practices, rather than regulatory mandates.

interconnection arrangements into the IP world now put such voluntary arrangements at risk, as certain providers seek to extend perceived regulatory entitlements as broadly as possible.⁷

Given the early state of the IP transition, it also would be impossible for the Commission to craft rules that reflect prevailing standards and practices (since they don't exist) and it could dictate potentially inefficient outcomes. Instead, the Commission should exercise regulatory restraint as it has done -- with unalloyed success -- for next-generation broadband networks and services.

Given these considerations, the Commission should design any trials related to the TDM-to-IP transition with the following principles in mind:

- *IP-to-IP interconnection trials should be conducted in markets in which the ILEC has deployed IP technology.* Until an ILEC has deployed such technology in a market, there would be little value in it participating in a trial, as it would receive the traffic in IP and immediately convert it to TDM for transport and termination. Such a trial would also impose unreasonable costs on the ILEC, as it would have to deploy technology solely to undertake this useless conversion for purposes of the trial. Further, it is unnecessary to include any TDM interconnection arrangements with VoIP providers in the trial, as there are already well-established methods for VoIP providers to exchange such traffic through CLEC interconnection arrangements.
- *Providers should also be free to offer, on a trial basis, IP voice interconnection arrangements of their choosing.* Similar to the Commission's approach in the VoIP numbering trials, such provider-initiated trials would help identify alternative interconnection arrangements while enabling providers to select the geographic areas best suited for trials.
- *The trials should address the full scope of issues arising from the TDM-to-IP transition, rather than focusing on the technical aspects of "VoIP interconnection."*⁸ Well-designed trials would explore all the technical and logistical issues implicated by the transition, consistent with the broad scope of issues in the TDM-to-IP trials proposed by AT&T last year.

⁷ See also Comments of Comcast, WC Docket Nos. 10-90, *et al.*, at 27 (Feb. 24, 2012) (Comcast FNPRM Comments) (noting that technological changes "could suddenly catapult the Commission into the regulation of the Internet backbone, even if it agrees, as it should, that this is a line it should not and will not cross.").

⁸ See Public Notice at 3.

- *Trials should be done outside the section 251 regulatory structure.* One of the main purposes of the trials is to determine what regulations, if any, should apply to these next-generation interconnection arrangements. Even a regulatory backstop (such as through a regulatory dispute resolution process) will constrain innovation and lead to predefined, suboptimal outcomes.
- *The Commission should establish a transparent process to ensure good-faith collaboration by all trial participants.* Not all providers share the same incentives and enthusiasm to make the trials a success. Certain CLECs have made repeated demands, both in filings at the Commission and requests for interconnection, for interconnection arrangements that either wholly ignore the need to accommodate the remaining attributes of TDM networks or entail a reflexive application of section 251 to IP-to-IP interconnection for voice services -- or both. Given this apparent agenda, the Commission should closely monitor any trials to ensure all participants are pursuing the stated objectives of the trial.

In addition to overseeing such trials, the Commission should maintain policies that promote commercial arrangements for the exchange of voice traffic in IP format. Such arrangements will enable providers to work through technical and logistical issues in a manner tailored to their network designs and business considerations, foster innovation and experimentation, and allow providers to gradually scale these arrangements to cover additional services and larger geographic areas. The Commission can help facilitate such arrangements by avoiding premature regulation that would codify a particular network architecture or interconnection model. Combined with its oversight of appropriately-designed trials, such regulatory restraint will further the TDM-to-IP transition to the benefit of all consumers.

II. TRADITIONAL UTILITY REGULATORY CONCEPTS HAVE NO RELEVANCE TO THE IP TRANSITION

Before taking any action in the area of technology transitions, the Commission and the Task Force must recognize that the TDM-to-IP migration presents an entirely new paradigm where legacy utility regulatory concepts have no relevance. This is true whether the issue is the appropriate regulatory framework for all-IP networks, the potential imposition of new regulatory

obligations for IP interconnection to existing TDM networks during a transition, or decisions around whether or how to conduct potential trials related to either scenario. In this area, the key economic principles underlying legacy regulation have no place. When it comes to the migration to IP networks, there is no dominant provider, no monopoly bottleneck, and none of the other economic assumptions that have justified a heavy regulatory hand for legacy telecommunications companies in the past.

As CenturyLink and numerous other parties have demonstrated -- most recently in comments filed in connection with the *USF/ICC Transformation Order Further Notice* and the AT&T and the National Telecommunications Cooperative Association (NTCA) petitions regarding the IP transition -- this is an area of thriving competition.⁹ The existing record already makes undeniably clear that ILECs are not incumbents and, indeed, that there are no incumbents in the IP-based voice and broadband markets. The relevant services are provided by cable companies, wireless providers, satellite providers, and new competitive entrants -- all, in addition to more traditional wireline companies like CenturyLink. In every conceivable service category, ILECs have far fewer customers than many of their competitors.

IP voice services, generally. It is by now very old news that ILECs possess a minority share of the market overall for voice services and that the number of households purchasing voice services from ILECs continues to shrink at a 10% rate annually. This finding was a

⁹ See, e.g., Comments of Verizon and Verizon Wireless, GN Docket No. 12-353 at 19-20 (Jan. 28, 2013) (Verizon TDM-to-IP Comments); Comments of XO Communications, LLC, GN Docket No. 12-353 at 7-8 (Jan. 28, 2013) (XO TDM-to-IP Comments); Comments of Cox Communications, Inc., GN Docket No. 12-353 at 2 (Jan. 28, 2013); Comments of Frontier Communications Corporation, WC Docket Nos. 10-90, *et al.*, at 10-11 (Feb. 24, 2012) (Frontier FNPRM Comments); Comments of CenturyLink, WC Docket Nos. 10-90, *et al.*, at 50-52 (Feb. 24, 2012) (CenturyLink FNPRM Comments); Reply Comments of CenturyLink, WC Docket Nos. 10-90, *et al.*, at 11-28 (Mar. 30, 2012) (CenturyLink FNPRM Reply Comments).

cornerstone of the Commission's reforms in the *USF/ICC Transformation Order*.¹⁰ As of the end of June 2012, there were 39 million interconnected VoIP subscriptions in the U.S., a nearly 70% increase in just three years.¹¹ Of the nation's 81 million wireline residential local telephone service connections, 40 percent were interconnected VoIP connections.¹² And, new competitors join the fray all the time. Recently, Hughes Satellite announced the nationwide launch of HughesNet® Voice, a feature-rich home Voice over IP (VoIP) solution.¹³

Consumer broadband services. In the consumer broadband services market, regulated wireline providers like CenturyLink compete with cable providers, wireless companies and other types of providers and have fewer customers and a smaller share of revenue as compared to their competitors.¹⁴

¹⁰ *Connect America Fund; A National Broadband Plan for Our Future; Establishing Just and Reasonable Rates for Local Exchange Carriers; High-Cost Universal Service Support; Developing an Unified Intercarrier Compensation Regime; Federal-State Joint Board on Universal Service; Lifeline and Link-Up; Universal Service Reform - Mobility Fund*, WC Docket Nos. 10-90, 07-135, 05-337, 03-109, CC Docket Nos. 01-92, 96-45, GN Docket No. 09-51, WT Docket No. 10-208, Report and Order and Further Notice of Proposed Rulemaking, FCC 11-161, 26 FCC Rcd 17663, 17974-75 ¶¶ 885-886 (rel. Nov. 18, 2011) (*USF/ICC Transformation Order* or *Order*) (subsequent history omitted).

¹¹ See *Local Telephone Competition Status Report* at 14 (Table 3).

¹² *Id.* (Chart 3).

¹³ "Hughes Makes Satellite Home Phone Service Push," June 18, 2013, <http://www.telecompetitor.com/hughes-makes-satellite-home-phone-service-push/>.

¹⁴ See, e.g., Reply Comments of CenturyLink, GN Docket No. 12-353 at 7 (Feb. 25, 2013) (CenturyLink TDM-to-IP Reply Comments) ("CenturyLink's frequent competitor Comcast has almost twice as many broadband subscribers as CenturyLink's 5.8 million...and AT&T has more than 47 million smartphone users, all with broadband at the touch of an icon. In terms of revenue, CenturyLink reported revenues of \$18.4 billion for 2012, compared with \$127.4 billion, \$75.9 billion, and \$62.5 billion for AT&T, Verizon Wireless, and Comcast, respectively." (citations omitted)).

Business services. Similarly, for business services, CenturyLink competes with cable companies that have made significant strides in capturing market share in recent years¹⁵ as well as CLECs that are aggressively migrating into IP offerings of different kinds.¹⁶

In light of this record, ILECs clearly do not have a dominant market position today, as CLECs and some other commenters advocate. ILECs, rather than being incumbents, are new entrants. Thus, the economic principles underlying the current regulatory structure for TDM-based networks have no application to the IP migration. And, the application of heavy-handed legacy regulatory frameworks is clearly not justified. Most importantly, any concept of disproportionate treatment for a perceived incumbent must be discarded. New flavors of legacy regulation -- for example, the request by some that the Commission intervene to mandate that ILECs incur the cost of TDM-IP conversion as a method of encouraging IP voice interconnection -- should also be rejected outright.

III. THE IP TRANSITION IS UNAVOIDABLE AND IS ALREADY HAPPENING WHERE REGULATION DOES NOT STAND IN ITS WAY

When considering any regulatory action, even in a trial context, the Commission and the Task Force must also recognize that the IP transition is unavoidable from a technological standpoint and is already happening where regulation does not stand in its way. This is also a context where it is impossible for anyone to write meaningful *ex ante* rules. Thus, the focus should be to ensure that any action taken simply enables market-based solutions to continue to thrive and ensures that all trial participants collaborate in good faith to make the trials successful.

¹⁵ See, e.g., CenturyLink TDM-to-IP Reply Comments at 7-8.

¹⁶ See, e.g., *id.* at 8-9. By way of further example, in June of this year, tw telecom, described “Our Robust Market Reach”, which includes “75 U.S. metropolitan markets[,] Fiber networks spanning over 29,000 route miles... [and] 18,500 fiber connected buildings[.]” “Changing the way businesses Connect and Communicate”, tw telecom Investor Presentation, at 4, available at <http://www.twtelecom.com/investor-guide/investor-presentations/>.

This is the approach most likely to achieve what all parties agree is the ultimate end goal here -- encouraging innovation and costs savings, and providing benefits to consumers.

A. The IP Transition Is Inevitable And Is Underway.

Tremendous progress has already occurred in the IP transition and there is every reason to expect it will continue:

In significant part due to the Commission's historic restraint in regulating next-generation networks and services, investment in broadband deployment is thriving, with substantial network deployment by all competitors, whether cable or wireless, ILEC or CLEC.¹⁷ This investment is, in turn, creating the competition story described above.

The likely convergence of IP voice and data networks also contributes towards this undeniable expansion into next generation networks. This convergence will only further obliterate distinctions between "ILECs" and "CLECs" and other types of providers and generally eliminate the need to regulate voice service differently from others. Because of the highly distributed nature of broadband networks and the fact that voice is quickly becoming just another application over those networks, providers cannot avoid the need for interconnection with other providers.

¹⁷ Frontier FNPRM Comments at 2 ("Frontier is investing hundreds of millions of dollars to deploy broadband in predominantly rural areas[.]"); Comcast FNPRM Comments at 19 ("Comcast and other MSOs have invested heavily in the IP architecture that will deliver the future of communications."); XO TDM-to-IP Comments at 2 ("Throughout its existence, XO has been an industry innovator, a role it has continued to play as it invests to progress toward an all-IP network."); Verizon TDM-to-IP Comments at 5-6 ("Verizon has invested heavily in transitioning from its decades-old copper-and-TDM based networks to new fiber-based IP networks. Verizon has spent billions of dollars to deploy a fiber-to-the-premises network past nearly 18 million homes and businesses, offering voice, Internet, and video services. In addition, Verizon has invested billions more to make broadband wireless technology available throughout the country.").

When it comes to IP interconnection in a broad sense, this “IP migration in process” is not just a theoretical prediction. For decades, providers of IP data services have successfully exchanged traffic through commercially negotiated arrangements, without regulatory oversight. CenturyLink, like all other providers, already benefits from extensive voluntary commercial peering and transit agreements for the exchange of IP data traffic. CenturyLink also already has multiple voluntary IP voice traffic exchange agreements in place and is in the process of negotiating more. These agreements are for toll traffic and are entered into by CenturyLink’s historical IXC entity. But, they represent a significant first-step towards incorporating into actual real-life carrier relationships the varied technical, logistical, and economic issues teed-up in the Public Notice.¹⁸ There is no reason to believe that an increase in the volume of IP voice traffic over time will somehow alter the conditions that have already led to a well-functioning IP traffic exchange market without regulatory intervention.¹⁹ Rather, it is clear that progress in the migration of the industry along the unstoppable trajectory from TDM to all-IP networks will continue apace provided regulation does not stand in its way.

B. Given The Early State Of The Transition, It Would Be Impossible For The Commission To Write Meaningful Rules Today.

Given the early state of the IP transition, it is also essential that the Commission and Task Force exercise a considerable amount of regulatory humility. Because so much is not yet known, it would be impossible to write meaningful rules today. The network architecture that will be used is largely yet-to-be-built and will likely be evolving for the foreseeable future. In part, this has to do with the fact that different providers have widely differing legacy networks and service

¹⁸ Public Notice at 5.

¹⁹ As noted, some parties have suggested that VoIP constitutes only about one percent of all consumer IP traffic today and that this percentage will likely decline over time. *See* Comments of Sprint, WC Docket Nos. 10-90, *et al.*, at 17 (Apr. 18, 2011) (citing a 2010 study by Cisco).

areas. As a result, they face varied business cases, logistical challenges and the like and provider-specific IP transition strategies will be needed.

This situation is in stark contrast to the situation the Commission faced when it adopted rules for TDM interconnection. At that time, there was a single dominant provider in each geographic area. Each of those providers had a hub-and-spoke network architecture that had been in place for decades. All calls were carried in TDM format. In this historic context, the Commission could safely wade-in and create meaningful rules.

Finally, from a practical perspective, the IP transition context is not yet ripe for rulemaking. As a general matter, rules serve to increase predictability and reduce transaction costs. Historically, they generally follow case-by-case dispute resolution that evolves into efficient outcomes, as was done, for example, with the Uniform Commercial Code over a long time period. At bottom, the communications industry has not had sufficient market experience with IP voice interconnection to determine whether any rules are needed and, if so, what they should look like and do.

C. The First And Overriding Principle For Any Trials Should Be To Enable Market-Based, Organic Solutions.

Given the trends discussed above, the first and overriding principle that should guide any action by the Commission or Task Force for trials or any regulatory action of any kind in this area is to enable market-based, organic solutions. In other words, the surgeon's creed "First, Do No Harm" is in order here. The Commission and Task Force should avoid premature regulation that will skew the natural evolution towards IP-to-IP interconnection and all-IP networks.

The model for this approach should be the Commission's consistent de-regulatory path over the last decade-plus for next generation networks and services. During that time, the Commission has refrained from imposing blanket Title II obligations on broadband Internet

access services and IP voice services,²⁰ removed most unbundling obligations on ILEC next-generation networks,²¹ and eliminated dominant carrier regulation of most enterprise broadband services provided by ILECs.²² And the result, described above, is inescapable – thriving investment and competition. Going forward, if there is to be regulation at all, whether in a trial context or otherwise, it should be light touch regulation.

CenturyLink has previously articulated three principles that should guide the Commission’s approach, generally, in the area of IP migration. And, these principles apply as well in the context of potential trials. They are:

First, the same regulatory obligations should be applied to all IP networks and services, regardless of provider.²³

Second, the Commission should not apply any regulation to next-generation IP networks and services unless it is shown to be useful and necessary, based on real-world experience.²⁴

²⁰ See, e.g., *Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities*, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd 4798 (2002); *Appropriate Framework for Broadband Access to the Internet over Wireline Facilities*; Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 14853 (2005).

²¹ *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, Deployment of Wireline Services Offering Advanced Telecommunications Capability*, Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, 18 FCC Rcd 16978, 17142 ¶ 273 (2003) (subsequent history omitted).

²² See, e.g., *Petition of the Embarq Local Operating Companies for Forbearance Under 47 U.S.C. § 160(c) from Application of Computer Inquiry and Certain Title II Common-Carriage Requirements; Petition of the Frontier and Citizens ILECs for Forbearance Under Section 47 U.S.C. § 160(c) from Title II and Computer Inquiry Rules with Respect to Their Broadband Services*, Memorandum Opinion and Order, 22 FCC Rcd 19478 (2007); *Qwest Petition for Forbearance Under 47 U.S.C. § 160(c) from Title II and Computer Inquiry Rules with Respect to Broadband Services*, Memorandum Opinion and Order, 23 FCC Rcd 12260 (2008).

²³ CenturyLink Initial Comments, GN Docket No. 12-353 at 6-7 (Jan. 28, 2013) (CenturyLink TDM-to-IP Comments).

Third, the Commission should establish flexible guidelines for the transition to IP, rather than one-size-fits-all standards and deadlines.²⁵

D. The Most Significant Practical Challenge In Conducting Trials Is That Certain Providers May Lack Incentive To Make Market-Based Trials A Success.

The Public Notice suggests that, when it comes to establishing potential trials to help facilitate the TDM-to-IP transition, ensuring the “best behavior” of ILECs is a significant concern.²⁶ In fact, of far greater concern is the fact that certain providers are highly incentivized to not cooperate in making market-based solutions successful. ILECs have every incentive to demonstrate the viability of a market-based approach. And, if the Commission and Task Force succeed in creating the right kind of fish bowl, with adequate transparency, and ensure that providers are properly incentivized, a market-based approach will work. But, other providers, for example certain CLECs, self-servingly seek to have the Commission extend the full panoply of legacy regulatory frameworks to next generation networks immediately. There is, thus, a very real danger that these parties will simply sit back or make unreasonable demands and make no good faith effort to work-out voluntary solutions, so that they can complain after-the-fact that any lack of progress is proof that heavy-handed regulation is needed.

By way of example, CenturyLink has started to receive proposals from certain providers that effectively premise any potential IP interconnection arrangement on the assumption that both sides have already reached the end-state of an all-IP network. Some of these providers mistakenly point to the Commission’s recent extension of limited numbering rights to a few VoIP providers in a trial as having dictated that this is the right approach. These proposals

²⁴ *Id.* at 7-9.

²⁵ *Id.* at 9-10.

²⁶ Public Notice at 12.

wholly ignore the need to accommodate the remaining attributes of TDM networks and the industry standards associated with those networks - such as routing by the LERG. And, their communications explicitly suggest that, if CenturyLink's response to their interconnection proposal includes an effort to address these issues, it will be deemed bad faith. Still other providers suggest in their proposals that anything short of the equivalent of full section 251 and section 252 interconnection will be deemed bad faith. Both approaches seek to prove a regulatory case rather than work toward real world solutions.

The Commission and Task Force must be vigilant to prevent such efforts from having any success.

IV. THE INEVITABLE IP TRANSITION WILL BE BEST PROMOTED THROUGH A COMBINATION OF COMMISSION-MONITORED AND INDIVIDUALLY-NEGOTIATED COMMERCIAL ARRANGEMENTS

Done right, technology trials can provide valuable insight into, and help resolve, technical and logistical challenges arising from the TDM-to-IP transition. Such trials alone are not enough however. The Commission should also encourage participation in and help facilitate voluntary agreements to exchange voice traffic in IP format.

A. Well-Designed Trials Will Help Facilitate The TDM-To-IP Transition.

The Commission has a long history of conducting technology trials at times of technological transition, most notably in the Wilmington, North Carolina, trial of the transition from analog to digital broadcast TV.²⁷ More recently, of course, the Commission launched a

²⁷ See *FCC Calls DTV Trial a Success*, CED Magazine, <http://www.cedmagazine.com/news/2008/09/fcc-calls-dtv-trial-a-success> (Sept. 11, 2008).

limited technical trial enabling interconnected VoIP providers to obtain direct access to telephone numbers from the numbering administrator.²⁸

If properly structured, trials focused on the TDM-to-IP transition will serve several valuable functions. They will enable participants to work through the countless technical and logistical issues arising from the IP transition, in a controlled environment, with the goal of establishing efficient network configurations and practices while minimizing any disruption on consumers. Such trials also may help identify differences in interconnecting providers' practices, enable the Commission to monitor issues associated with the transition, and highlight issues that require more work by standard-setting organizations. Finally, trials may shed light on the appropriate regulatory structure for these provider-to-provider arrangements.

With that said, the general design of the trials will largely dictate their usefulness. As a starting point, trials should be conducted in markets in which ILECs have deployed IP technology and should explore the multiplicity of issues presented by the IP transition, rather than narrowly focusing on particular technical issues -- or delving into new types of *TDM* interconnection arrangements for VoIP providers. The Commission also should avoid premature regulation (or even the threat of such regulation), which would lead to static and inefficient interconnection arrangements that fail to realize the benefits of this transformational shift in

²⁸ *Numbering Policies for Modern Communications*, Notice of Proposed Rulemaking, Order and Notice of Inquiry, 28 FCC Rcd 5842 (2013) (*VoIP Numbering Trial Order*). See also *In re Schools and Libraries Universal Service Support Mechanism*, Sixth Report and Order, 25 FCC Rcd 18762, 18785 ¶ 45 (2010) (trial program to investigate the merits and challenges of wireless off-premises connectivity services); *Initial Evaluation of the Performance of Prototype TV-Band White Space Devices*, Report, 2007 FCC Lexis 5753 (2007) (trial of prototype unlicensed low power radio transmitting devices that would be operated on frequencies in unused broadcast television bands); *Petition for Declaratory Ruling and Request for Expedited Action on the July 15, 1997 Order of the Pennsylvania Public Utility Commission Regarding Area Codes 412, 610, 215, and 717*, Memorandum Opinion and Order and Order on Reconsideration, 13 FCC Rcd 19009, 19027 ¶ 27 (1998) (state-administered experimental number-pooling trials).

technology. Finally, the Commission must closely monitor the trials to ensure good-faith collaboration by all participants.

1. The Trials Should Be Conducted in Markets in Which the ILEC has Deployed IP Technology.

The primary goal of any technology trial is to enable participants to identify and work through the relevant issues in a controlled environment. While a trial by its nature is artificial, the Commission should seek to design trials that closely replicate real-world conditions, including the challenges that providers and consumers will face with the transition to IP.

In this regard, it is helpful to recall the end point of the TDM-to-IP transition: a world in which VoIP service is simply another application carried on ubiquitous IP networks. In such a world, providers will routinely exchange voice traffic in IP format, as they do for IP data traffic today. But we are far from that point today. Like all voice providers that are not already operating wholly or mostly in IP, CenturyLink is actively pursuing this migration, motivated both by the imperative to offer innovative, state-of-the-art services *and* the impending obsolescence of TDM-based equipment in legacy networks. Given its expansive legacy network, CenturyLink's transition to IP will take a number of years in many markets.²⁹

Until it has installed IP technology in a given market, there would be little value in CenturyLink participating in a VoIP interconnection trial in that market. If it has not upgraded the market to IP, CenturyLink would need to spend capital to deploy IP-TDM conversion equipment, only so it can immediately convert voice traffic received in IP format to TDM format for transport and termination over its legacy network. Under such circumstances, it would be virtually impossible for CenturyLink to provide meaningful input on the real-world technical and logistical issues arising from the TDM-to-IP transition.

²⁹ See CenturyLink TDM-to-IP Comments at 4.

Exchanging voice traffic in IP format in a market that has not been upgraded to IP would also be of no benefit to consumers, as the IP handoff would merely shift the expense of the necessary TDM conversion to the terminating provider without any improvement in quality or efficiency. Put differently, there is no inherent efficiency in a provider accepting a call in IP and then converting it to TDM format, rather than just accepting the call in TDM format as it does today. When a terminating provider upgrades its network to IP, IP-to-IP interconnection will be rational and efficient. IP-to-IP interconnection in advance of deploying the IP network itself in a geographic area would drain the capital funding needed to deploy that and other similar next generation networks, to the detriment of the consumers.³⁰

2. Providers Should be Free to Offer, on a Trial Basis, IP Voice Interconnection Arrangements of Their Choosing.

In addition to any government-sponsored trials, the Commission should also permit provider-initiated trials, whereby a given provider would offer to interconnect and exchange voice traffic in IP format, on a trial basis, in a particular location or set of locations.³¹ That provider could then negotiate with other interested parties the rates, terms and conditions under which such interconnection and traffic exchange would occur. Such provider-initiated trials may reveal alternative approaches to the various technical and logistical issues presented by the IP migration, while enabling providers to select geographic areas best suited for such trials.

³⁰ See CenturyLink FNPRM Comments at 53-55. As noted, CenturyLink already leverages the IP functionalities in its IXC affiliate's long-distance network to accept toll traffic in IP format. CenturyLink currently lacks the infrastructure in its local network necessary to handle the conversion of IP voice traffic to TDM format.

³¹ This is similar to the approach adopted by the Commission in permitting Vonage and other interconnected VoIP providers to obtain direct access to telephone numbers on a trial basis in provider-specified LATAs or rate centers. *VoIP Numbering Trial Order*, 28 FCC Rcd at 5883 ¶ 101.

3. The Trials Should Address the Wide Scope of Issues Arising from the TDM-to-IP Transition.

The TDM-to-IP transition will fundamentally alter the way in which voice providers interact with each other and their customers. While providers typically establish separate interconnection points in each LATA, or even in smaller geographic areas, for the exchange of TDM traffic, it is generally recognized that significantly fewer points of interconnection will be necessary in an all-IP world.³² Further, the transformation of voice service from a standalone telecommunications service to one of many applications riding on an IP network may lead to a gradual convergence of the facilities used to exchange IP data and voice traffic, as standards and practices develop to ensure real-time performance across providers' IP data networks.³³ At the same time, virtually all consumers are no longer dependent on so-called "carriers of last resort," as they now can choose from a long list of facilities-based and over-the-top providers of voice services.

A well-designed trial will consider all aspects of these issues. The technical aspects of VoIP interconnection are just one set of the many operational and logistical issues implicated by the IP transition. Moreover, providers already know how to exchange voice traffic in IP format because many of them, including CenturyLink's IXC affiliate, do it today. What makes the TDM-to-IP transition particularly challenging is the existence of *legacy* networks, *legacy* interconnection arrangements, and *legacy* customer relationships. The proposed trials should

³² See, e.g., Comments of Bandwidth.com, GN Docket No. 12-353 at 6 (Jan. 28, 2013) (proposing that providers be required to establish no more than one point of interconnection in each state); Reply Comments of T-Mobile, GN Docket No. 12-353 at 1-2 (Feb. 25, 2013) (suggesting that IP networks will require fewer points of interconnection (POIs) and advocating for a set of regional POIs, ideally located at Internet exchange points where providers already exchange data traffic).

³³ See, e.g., Comments of Sprint, GN Docket No. 12-353 at 29 (Jan. 28, 2013); Comments of XO, WC Docket Nos. 10-90, *et al.*, at 2 (Feb. 24, 2012).

take a comprehensive approach to these realities, consistent with the broad scope of issues in the trials proposed by AT&T last year.³⁴

4. The Very Nature of a Trial of New Technology Requires the Absence of Legacy Regulation.

CenturyLink agrees that the Commission should allow providers that participate in a trial to negotiate in good faith “without a backstop of regulations or specific parameters[.]”³⁵ As noted, the primary purpose of the proposed IP-to-IP trials is to allow carriers to work through the various logistical and technical issues associated with VoIP interconnection arrangements. Even the possibility of intervention by the Task Force, Commission or a state commission would skew negotiations and reduce the likelihood of voluntary agreements. It would also hinder experimentation and place a thumb on the scale in favor of legacy network configurations and practices that are ill-suited to IP-based interconnection arrangements.

For the same reason, the Commission should not establish dispute resolution procedures that involve recourse to a regulator. Given the absence of well-defined industry standards, the threat of such intervention would equate to a regulatory backstop. As a practical matter, an agreement cannot be “arbitrated” without reference to some standard, and CLECs will undoubtedly insist that the section 251/252 regime is the appropriate standard for that purpose. At the same time, application of a duty to negotiate in good faith is most likely too general to provide a meaningful standard for arbitration. Again, providers should be given latitude to work through the various technical and logistical issues through negotiation, rather than by resorting to legacy regulations rooted in yesterday’s technology.

³⁴ See AT&T Petition to Launch a Proceeding Concerning the TDM-to-IP Transition, GN Docket No. 12-353 (Nov. 7, 2012).

³⁵ Public Notice at 5.

Above all else, none of the trials should be subject to the section 251/252 framework.³⁶ As a legal matter, that framework, and particularly its ILEC-specific obligations, does not apply to VoIP interconnection.³⁷ Moreover, applying the section 251/252 framework to a trial would destroy CLECs' incentives to work toward efficient interconnection solutions, as opposed to insisting on one-sided arrangements that serve their own interests. It would also lead to inefficient network configurations. For example, application of section 251(c) in this context could lead to hundreds of interconnection points -- despite wide consensus that much fewer interconnection points will be necessary for VoIP interconnection than are traditionally found in TDM networks -- as CLECs demand interconnection at their own set of purportedly "technically feasible" interconnection points.³⁸ Similarly, a CLEC might demand that an ILEC exchange traffic at a single, national interconnection point that is convenient for the CLEC, but that would require the ILEC to transport CLEC traffic across the country for termination, thereby shifting the CLECs' transport costs to the ILEC.

5. The Commission Should Establish a Transparent Process to Ensure Good-Faith Collaboration by All Trial Participants.

As noted, not all potential participants will be motivated to make the trials successful.³⁹ Thus, it is critical that the Commission establish processes to ensure good faith collaboration by all trial participants. In particular, the Commission should require trial participants to provide

³⁶ See Public Notice at 5 (noting the possibility of conducting some trials without a regulatory backstop and others "pursuant to the existing section 251/252 framework or a similar process (including one that does not require any party to concede that sections 251/252 apply as a legal matter).").

³⁷ See CenturyLink FNPRM Reply Comments at 23-28.

³⁸ See 47 U.S.C. § 251(c)(2). See also 47 C.F.R. § 51.305(e) ("An incumbent LEC that denies a request for interconnection at a particular point must prove to the state commission that interconnection at that point is not technically feasible.").

³⁹ See *supra*, Section III.D.

periodic updates on the progress of the trial, identifying the technical and logistical issues that have arisen and those that the participants have been unable to resolve.

B. Aside From Overseeing Such Trials, The Commission Should Maintain Policies That Promote Commercial Arrangements For The Exchange Of Voice Traffic In IP Format.

While well-designed, Commission-sponsored trials can provide valuable insights into the TDM-to-IP transition, such formal trials have certain shortcomings. Despite the best intentions of the Commission and trial participants, such trials are by their nature artificial and static. Just as importantly, analogous to the “Observer Effect” in physics,⁴⁰ the Commission’s oversight of the trials will alter participants’ behavior and the results of the trials. Fortunately, voluntary commercial arrangements to exchange voice traffic in IP format provide a ready complement to the proposed trials. Given the benefits of these commercial arrangements, the Commission should maintain policies that allow these arrangements to flourish and spread.

Such commercial arrangements provide three distinct advantages over formal trials.

First, such arrangements allow providers to work through technical and logistical issues in a manner tailored to their specific networks and business considerations. Given the wide variance in providers’ network configurations and business plans, it is not possible to generalize from the experiences of a handful of carriers participating in a trial, particularly if the trials are conducted in similar geographic areas. Individual providers are in the best position to resolve these issues for themselves, particularly given the current absence of industry standards, and individually-negotiated commercial arrangements allow such providers to create customized approaches to technical and logistical issues such as the location of physical interconnection

⁴⁰ The Observer Effect refers to changes that the act of observation make on the phenomenon being observed. See Wikipedia, *Observer Effect (Physics)*, [http://en.wikipedia.org/wiki/Observer_effect_\(physics\)](http://en.wikipedia.org/wiki/Observer_effect_(physics)).

points, IP interfaces and call signaling and set up.⁴¹ For example, while there is widespread agreement that IP networks should not replicate the hub-and-spoke topology of the PSTN, there is no single, uniform approach to VoIP interconnection and there likely will never be. Commercial agreements allow providers to negotiate network configurations that best accommodate their underlying networks. Likewise, voluntary arrangements enable a provider to tailor its interconnection arrangements in other ways, such as by choosing to exchange traffic through its national IXC affiliate, rather than through individual LEC affiliates.

Second, allowing providers to design their own interconnection arrangements will foster experimentation and innovation, because those arrangements can be easily modified if a particular approach proves unworkable in practice. Again, with respect to the number and location of points of interconnection, for example, commercial arrangements allow parties to experiment with different configurations, which will not be possible in the proposed trials.⁴² Because commercial agreements tend to cover areas larger than a single metropolitan area, they also allow parties to experiment with interconnection in larger geographic areas.

Third, commercial arrangements can be gradually scaled in terms of the services and geographic areas covered, in a way that cannot easily be done in a predefined trial. For instance, a commercial arrangement might start with the exchange in IP format of long distance voice traffic originated and terminated in a given metropolitan area, but subsequently be expanded to include additional services and larger geographic areas.

Although the Commission has no direct role in these voluntary arrangements, its policies toward VoIP interconnection could determine whether such arrangements continue to grow or

⁴¹ See Reply Comments of Verizon and Verizon Wireless, GN Docket No. 12-353 at 9 (Feb. 25, 2013) (noting the issues that must be addressed by providers exchanging voice traffic in IP format).

⁴² See Public Notice at 5 (proposing to conduct trials in “a few” geographic markets).

flounder. Most importantly, the Commission can help facilitate such arrangements by avoiding premature regulation that would codify a particular network architecture or interconnection model or give certain providers a regulatory entitlement to demand interconnection arrangements that further their own best interests, regardless of whether they are efficient overall.⁴³

V. CONCLUSION

Assuming they are properly designed, technology trials focused on the IP-to-IP interconnection that will occur with the TDM-to-IP transition could hasten this important transition by establishing a forum for providers to work through the myriad technical and logistical issues implicated by the transition. Conversely, poorly-designed trials -- particularly trials that include a regulatory backstop -- could slow the transition and impede the development of interconnection arrangements taking advantage of the capabilities and efficiencies of next-generation IP networks. Such a regulatory backstop is also unnecessary in light of both market realities (*i.e.*, the lack of dominant providers of the services in question) and changes in technology that have invalidated the economic principles underlying the relevant legacy regulations. Given these considerations, the Commission should initiate trials consistent with the principles outlined in CenturyLink's comments and also maintain policies that promote corresponding commercial arrangements.

⁴³ Such rules could also have other unintended consequences, including endless disputes about whether a particular interconnection arrangement falls within the scope of the Commission's rules, unforeseen arbitrage opportunities, and potentially dangerous intervention into as-yet-unregulated IP peering arrangements. CenturyLink FNPRM Reply Comments at 20-21.

Respectfully submitted,

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July 8, 2013